

Professional training of identification of distal caries in mandibular first primary molar and mesial caries in primary second molar

Type Of Study – Retrospective study

Running title- Distal caries in mandibular first primary molar having mesial caries in second primary molar.

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ABSTRACT

Dental caries is found to be the most common oral health issue and is a widespread oral disease in children around the globe. Interproximal caries lesions develop between the contacting proximal surfaces of two adjacent teeth. In primary dentition, Molars are the teeth most often affected. The aim is to investigate the Prevalence of distal caries in mandibular first primary molar and mesial caries in second molar .A University based study was conducted on mandibular first and second molar. Data collection was done by reviewing the patient records and analysing the data of 572 and 663 patients with class II caries in mandibular right and left molars respectively and 182 patients with distal caries in mandibular first primary molar and mesial caries in second molar from June 2020 to March 2021, then excel tabulation, Statistical analysis was done using SPSS and Pearson chi-square test was performed. The age ranged 2 to 12 years. Out of the total population 41.57% were female and 58.43% were males. The results showed

that 50.55% represents prevalence of distal caries in mandibular left first molar and mesial caries in mandibular left second molar, while 49.45% represents prevalence of distal caries in mandibular right first molar and mesial caries in mandibular right second molar. The conclusions of the study is that in 14.74% of cases, the distal caries in the mandibular first primary molar is associated with mesial caries in the second molar.

Key Words

Mesial caries, Distal caries, mandibular first, second molar, Novel approach.

INTRODUCTION

Dental caries is found to be the most common oral health issue and is a widespread oral disease in children around the globe, In spite of considerable caries reductions in children and adolescents in many countries (1). Dental caries affect 60 to 90% of school aged children and adults. In India children comprise 40% of a rapidly growing population, The prevalence of dental caries varies from 33.7% to 90% in the paediatric population and is increasing at an alarming rate (2) (3). Caries can affect each tooth and surface, with a predilection for pits, fissures and proximal surfaces. Caries at other, less vulnerable, sites could be a sign of severe caries. However, caries patterns can also be associated with aetiology. The pattern of dental caries not only varies with age, sex, socio economic status, race, geographical location, food habits and oral hygiene practices but also within the oral cavity (4). Many investigators have tried to find a pattern for predicting caries as this becomes more important when caries prevalence in the population is declining.

Primary teeth begin to erupt in infants' mouths at about 6 months of age, and are completed at age 3 to 5, including 10 teeth in the maxilla and 10 in the mandible to meet nutritional needs in infancy (5). Since primary teeth are the basis of permanent teeth, on the one hand, and they have a high susceptibility to caries, on the other hand, these teeth are very important and maintaining their health is considered a serious health concern for children (6). The comparison of mean dmft and dmfs scores from the left and right sides of maxillary and mandibular arches, for both first and second molars, showed no significant differences in primary teeth, which may suggest that the homologous left and right molars have a similar caries pattern as noted by Vanobergen et al 2013 (7). Dental problems in children have been shown to be predictive of future dental problems, growth and development by interfering with comfort, nutrition.

When a cavity occurs on the mesial part of your tooth, it's called mesial tooth decay. Because the mesial surface of one tooth often touches the adjacent tooth's distal surface, it may likely cause caries in the distal surface of adjacent tooth. Interproximal caries lesions develop between the contacting proximal surfaces of two adjacent teeth (8). They first appear clinically as opaque regions and are caused by the loss of enamel translucency at the outermost enamel between the contact point and the top of the free gingival margin (9). According to Their Severity. The appearance of interproximal caries can be classified as incipient, moderate, advanced, or severe, depending on the amount of enamel and dentin involved in the caries process. Caries lesions are developed on the biofilm-tooth interface (10) and the key factor of their formation is the presence of acid-producing biofilm of the tooth surface. Usually, minerals from oral fluids and teeth are in balance. Approximal surfaces of all molars teeth demonstrated the highest caries rates. Approximal surfaces have been pointed as a challenge regarding the control of caries lesions in primary teeth, especially due to the larger area of contact between adjacent teeth and limited salivary access (11).

Caries prevalence was higher in posterior teeth as compared to anterior teeth in both the sexes in primary dentition (12). Hypomineralization of the second molars could be an explanation for the differences in caries prevalence between first and second primary molar. Dental caries shows some relation to the arches regarding prevalence pattern and the mandibular arch is affected more often than the maxillary arch and it was significant

statistically in both the sexes. They observed the lowest disease incidence on mandibular anterior teeth, while lower molars were the most severely affected teeth in the entire dentition and more commonly affected than upper molars (13). It is of interest therefore, to know the relative caries susceptibility of the teeth in the mandible. Hence, the main objective is to evaluate the association of distal caries in mandibular first primary molar and mesial caries in primary second molar. Our team has extensive knowledge and research experience that has translated into high quality publications (14–18)(18–22)(19–23)

MATERIALS AND METHODS

A. Study setting

A University based study was conducted among 572 and 663 patients with class II caries in mandibular right and left molars respectively. Mandibular molars that were indicated for class II caries were taken into consideration. The study was conducted with the approval of the Institutional Ethics Committee [SDC/SIHEC/2020/DIASDATA/0619-0320]. Cross verification was done by two reviewers and the measures taken to minimize the sampling bias are by including all the data available with no sorting process. Inclusion criteria included the mandibular first and second molar in children aged between 2 to 12 years, the teeth that had demonstrated class II caries, and teeth that showed the presence of distal caries in mandibular first primary molar and mesial caries in primary second molar.

B. Data collection

Data collection was done by reviewing the patient records and analysing the data of patient's from June 2020 to March 2021, excel tabulation of the data, statistical analysis was done using spss IBM version 20.0 and Pearson chi-square test was performed.

C. Statistical Analysis

Incomplete or censored data was excluded from data. Statistical analysis was done by exporting the data to SPSS. Descriptive distribution of 182 childrens having distal caries in mandibular first molar with mesial caries in mandibular second molar was done.

RESULTS:

Among the children aged between 2 to 12 years, who fulfilled the inclusion and exclusion criteria were included, various graphs were plotted to obtain the conclusion.

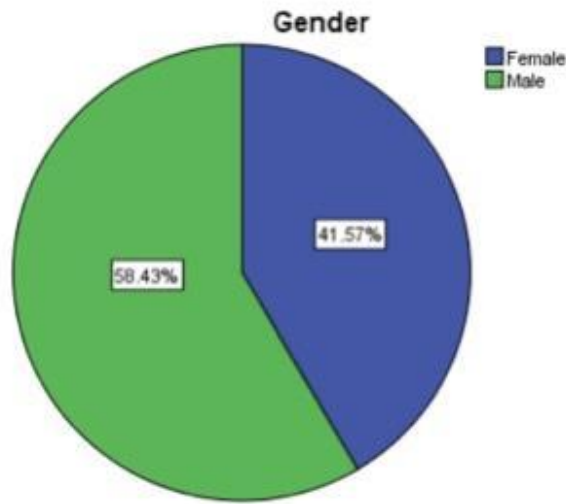


Fig:1- Pie chart showing percentile distribution of gender, The highest of 58.43%(green) was males while lowest of 41.57%(blue) was females .

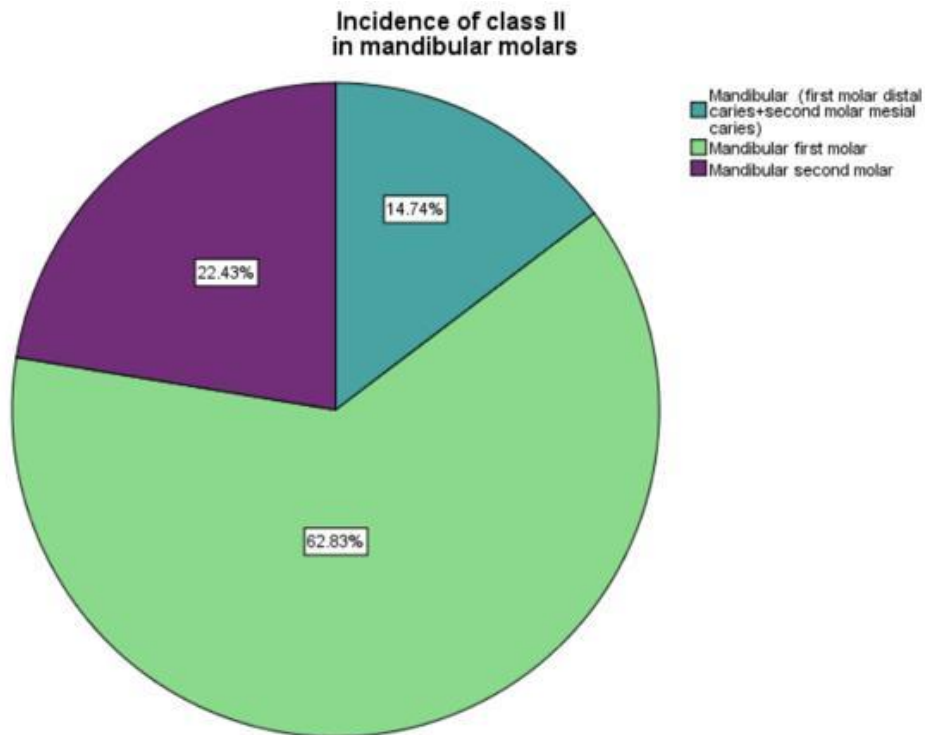


Fig:2- Pie chart showing percentage distribution of prevalence of class II varies mandibular molars of both sides, The highest incidence of classII caries was seen in mandibular first molar with 62.83%(green), 22.43%(purple) of them have class II caries in mandibular second molar and lowest incidence 14.74%(dark green) of cases, distal caries in mandibular first primary molar is associated with mesial caries in second molar.

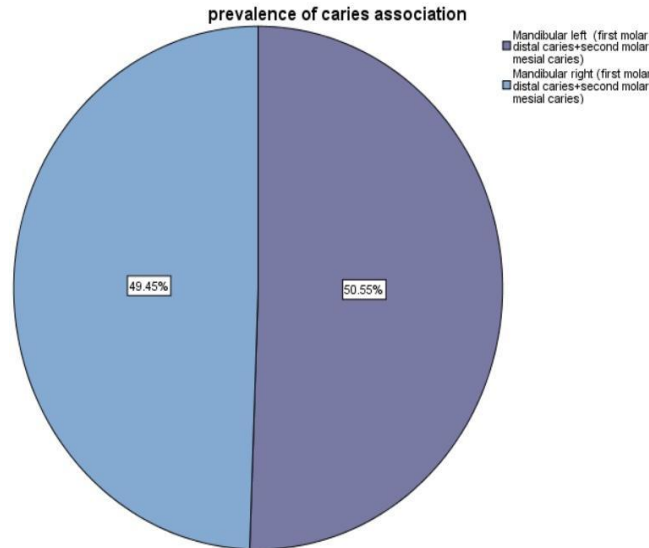


Fig:3- Pie chart showing percentage distribution of prevalence of distal caries in mandibular(right and left side) first molar and mesial caries in second molar simultaneously, The highest incidence (50.55%) of distal caries in mandibular left first molar and mesial caries in second molar while lowest incidence(49.45%) of distal caries in mandibular right first molar and mesial caries in second molar.

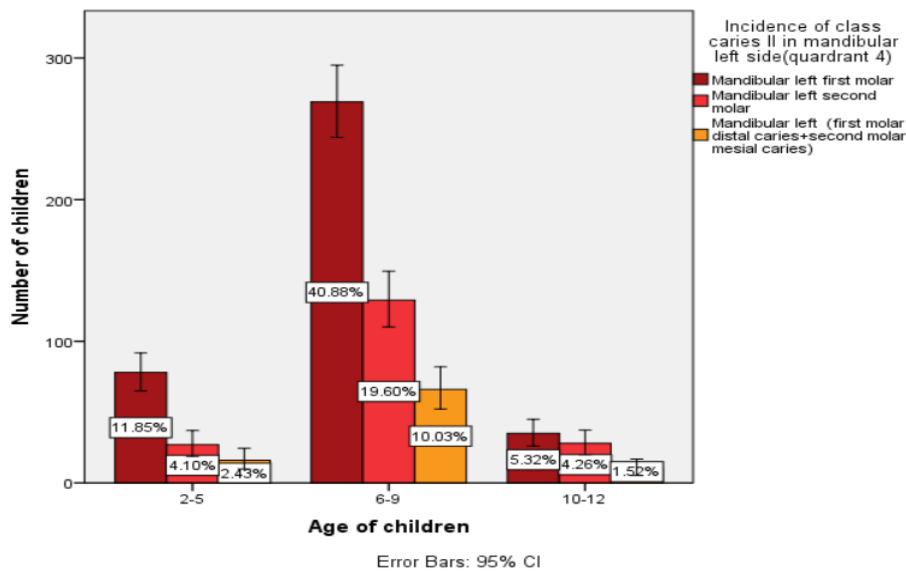


Fig:4-Bar graph depicts the association between the age of the child and the incidence of classII caries in the mandibular left side.X-axis represents the age group of the children and Y-axis represents the number of the childrens. Brown colour denotes class II caries in mandibular left first molar,red colour denotes class II caries in second molar and yellow colour denotes distal caries in mandibular left first molar and mesial caries in second molar simultaneously. The highest incidence (10.03%) of distal caries in mandibular left first molar and mesial caries in second molar simultaneously was observed in the age group of 6-9 years whereas between 2-5 years of age, the incidence is 2.43% and the lowest incidence(1.52%) was observed between 10-12 years of age. The difference was statistically insignificant (Chi-Square test;p value is 0.164 (>0.05) - statistically not significant)

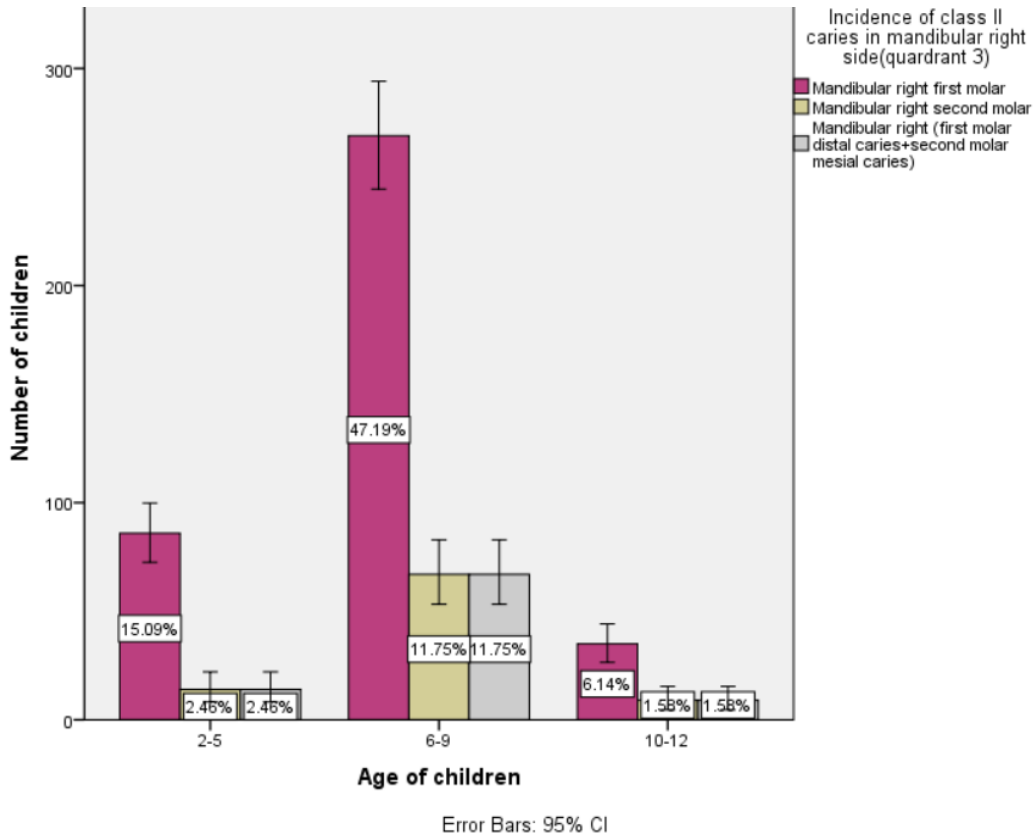


Fig:5 - Bar graph depicts the association between the age and the incidence of class II caries in the mandibular right side. X-axis represents the age group of the children and Y-axis represents the number of the children. pink colour denotes class II caries in mandibular right first molar, sandal colour denotes class II caries in second molar and grey colour denotes distal caries in mandibular right first molar and mesial caries in second molar simultaneously. The highest incidence (11.75%) of distal caries in mandibular right first molar and mesial caries second molar simultaneously was observed in the age group of 6-9 years whereas between 2-5 years of age, the incidence is 2.46% and between 10-12 years of age, the lowest incidence (1.58%) was observed between 10-12 years of age. The difference was statistically insignificant (Chi-Square test; p value is 0.651 (>0.05) -statistically not significant).

DISCUSSION:

This study showed that majority of the patients reporting to this department had a Class II carious lesion in their first molars commonly with a percentile distribution of 62.83% as compared to second molars and predominantly between the age group 6-9 years and among the age ranged from 2 to 12 years. The mandibular first molars were involved in most cases. This might be due to improper oral hygiene measures. Similarly, the study conducted by Apostle P. Vanderas et al. has reported that first molars' proximal surfaces are more susceptible to developing dental caries than other proximal surfaces (24).

The study showed that the Prevalence of distal caries in the first molar and mesial caries in the primary second molar simultaneously was observed in 14.74% of childrens when compared with class II caries in first and second molars separately.

Among 14.74% mentioned above, In comparison of prevalence of distal caries in the first molar and mesial caries in the primary second molar simultaneously between mandibular left and right side primary molars, in mandibular left molars the incidence was 50.55% and in representative to mandibular right molars the incidence was 49.45%. Similar study by Katerina Kavvadia et al reported that Proximal caries present on the primary second molars distal surfaces increases the risk of developing caries on the permanent first molars mesial surfaces(25). This risk, however, is different among the paired surfaces studied. The progression of proximal caries from one state to another is extremely variable not only between individuals but also between carious lesions of the same individual, indicating different cariogenic conditions (26)(27).

Among the study population, caries was significantly more prevalent in males than in females , which suggest that dental caries show some predilection for sex. Similar findings were noted by Peter. F Infante, George M. Gillespie(1976)(28); Zerfowski M et al (1997)(29). This higher caries prevalence in males in primary dentition was due to early eruption and longer retention of these teeth in males (30).

It is always possible to prevent dental caries in primary teeth and lower the caries prevalence in young children with proper dental health education and to put more emphasis on prevention of interproximal caries. Dietary control, and oral hygiene instruction should be followed. The best way to prevent interproximal decay is to floss the teeth in conjunction with daily brushing. The floss helps break up the plaque that has an affinity for the interproximal area. Fluoride rinses also are useful in toddlers and younger patients.

CONCLUSION:

Within the limits of study, it is observed that the Mandibular First molars had significantly more caries lesions than second molars and in 14.74% of cases, the distal caries in the mandibular first primary molar is associated with mesial caries in the second molar when compared with class II caries in first and second molars separately. Among 14.74% mentioned above, In comparison of prevalence of distal caries in the first molar and mesial caries in the primary second molar simultaneously between mandibular left and right side primary molars, the incidence was 50.55% and 49.45%. respectively.

Limitations of the study are that ,small sample size and involvement of investigating the prevalence of distal and mesial caries in mandibular first molar and in second molar respectively. Furthermore studies should be conducted with large sample size and investigate the involvement of interproximal caries of all primary teeth.

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CONFLICT OF INTEREST:

None declared.

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